

a shunt element connected to the first resonator at the first electrode; and

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Concl'd
a second resonator series connected to the first resonator [or to the shunt element] at a second electrode,

the second resonator and the first resonator [or the second resonator and the shunt element] being the only connections to the second electrode.

REMARKS

As a preliminary matter, applicant notes that a Notice of art cited by Applicant, PTO-1449, was not received by applicant as part of the Office action nor checked on the action's cover sheet. Applicant submitted a form PTO-1449 on April 24, 1992 along with copies of each of the patents listed thereon. The Examiner is requested to make these submitted patents of record in this application and return an initialed copy of PTO-1449 to applicant showing his consideration of them. If the Examiner did not receive the applicant's submission, he is requested to call the undersigned immediately.

Reconsideration of the application is requested. Applicant has amended claims 9 and 15 to meet the Examiner's concerns under § 112, second paragraph and amended 3, 5 and 7 to clarify what is claimed. Claims 12 and 17 have been canceled. Applicant respectfully traverses the rejections of the claims under §§ 102(b) and 103 for the reasons set forth below.

To avoid the need for a further advisory action, the undersigned urges that the Examiner call if he still believes the claims, as amended, are not yet suitable for allowance.

Correction and clarification of the specification and drawings

To clarify the nature of the prior art and the advantages of the present invention, applicant desires to substitute perspective views for cross-sectional views, label several drawings as prior art, correct identifying symbols on other drawings and amend the written specification to reflect these changes. The perspective views show more readily the differences between the prior art and the claimed invention than the cross-sectional views earlier submitted. In particular, the perspective views show the claimed isolation of particular electrodes necessary to form series connected resonators.

None of these additional drawings or changes adds new subject matter to the application. Each new drawing relates to a present circuit schematic drawing in the application and merely provides a better view of the circuit's physical implementation. Several cross-sectional views have also been replaced with other cross-sectional views that better show the claimed structure.

If the Examiner believes the number or nature of these amendments to the specification render it difficult to consider the case, applicant is willing to submit a substitute specification incorporating these amendments per 37 C.F.R. § 1.125.

The claims, which are adequately supported by the originally-filed specification and drawings, have not been amended to reflect these changes. The Examiner is requested to review these changes and call the undersigned if he has any concerns about them.

§ 112, second paragraph rejections

Claims 9 and 15 have been amended to omit the alternative connections that the Examiner found confusing. Clearly now, claims 9-11 read on FIGS. 8 and 23, claims 13-14 read on FIGS. 13 and 23, and claims 15-16 read on FIGS. 18 and 23. FIG. 11 is prior art and is not covered by any of the claims.

§ 102(b) rejections

Claims 6-8 each call for two series connected resonators connected only to each other at the third electrode. This connection is the result of decomposing a single resonator into equivalent series connected resonators so that undesirable nonplanar connections are not required to connect the resonator to other elements in a circuit. There are no, and cannot be, other connections to the third electrode. See pp 11-14 of the application for a more complete explanation.

None of the six references the Examiner relies on for anticipation of claims 6-8 shows this claim element. Smythe shows in FIGS 2a-c and 3a-b a third electrode E3 that connects not only resonators R1 and R2, but also connects to ground. Clearly R1 and R2 in Smythe are not the decomposition of a single resonator, as in the claimed invention.

Similarly, in Japanese patent '31609, electrode 5 connects to ground as well as to connecting two resonators formed with separate electrodes 7.

Nagata discloses in FIG. 1 two electrodes 2a and 2b on one major surface and a third electrode 4 on opposite major surface. However, the electrode 4 is connected to an electrical

terminal 9 in addition to connecting resonators formed with electrodes 2a and 2b. See col. 2, lines 40-49.

Toyoshima '176 shows in its several figures a three terminal electrode-electrical filter. Each of the electrodes 2a, 2b and 5 is connected to a lead wire. In particular, the third electrode 5 connects to lead wire 7 in addition to connecting together resonators formed with electrodes 2a and 2b.

Pradal shows in FIG. 7 a three electrode crystal filter. A third electrode on a lower surface of the piezoelectric material is again connected to ground in addition to forming resonators with electrodes on the material's upper surface. The other figures are perspective views of crystal filters, all showing an additional connection at the third electrode.

Berlincourt discloses several piezoelectric circuits that each have third electrodes opposite first and second electrodes. But as indicated in FIGS. 1-3a, in each case the third electrode provides an external connection in addition to connecting two resonators together. For example, the third electrode in FIG. 1 is counter electrode 25. According to Berlincourt, a common external connection is also made to counter electrode 25, which is formed integrally with counter electrodes 19, 23. Col. 3, lines 25-34. The cross-sectional views in FIGS. 4-8 of Berlincourt do not clearly show this external connection.

None of these patents describes, suggests or teaches the claimed structure of a third electrode inserted solely for forming two series connected resonators. Rather, in each of

§ 103 rejections

Claim 9 is best understood as an application of the invention to a T network. Claim 9 calls for a third piezoelectric resonator series connected to one of a pair of resonators at a second electrode. The third resonator and other resonator are the only connections to the second electrode. FIG. 8 shows this connection at "second" electrode M3 quite clearly. Unfortunately, the cross-sectional view of the claimed resonator in FIG. 9 does not show fully the isolation of electrode M3, and thus applicant has submitted substitute perspective views in FIGS. 9A-C to emphasize this isolation.

None of the patents relied upon by the Examiner to reject claim 9 shows or suggests the use of an isolated electrode within a T network. Curran '622 shows in each of its figures that each electrode physically connects to some other element, be it a lead to an external connection or to another electrode. Curran's FIG. 9 in particular shows T and pi networks of conventional design, each lacking the claimed electrode. Curran '276 also shows in FIG. 4 a conventional T network design that lacks the claimed electrode. Applicants can find no teaching in the Curran patents, and the Examiner has pointed to none, why it would be obvious to add an isolated electrode.

Berlincourt, as described above, lacks the claimed isolated second electrode. Each of the electrodes shown in its figures connects to some additional element. Nor is there any reason given in Berlincourt as to why it would be desirable to add such an electrode to carry out its teachings.

Yamamoto also lacks the claimed isolated second electrode. Each electrode shown therein connects to another

electrode or to a lead wire for an external connection. See, for example, electrode 40 in Figs 10a and 10b.

Claim 13 is an application of the invention to a pi network. As in claims 6 and 9, claim 13 calls for a series connected pair of resonators being the only connection to a third electrode. None of the prior art teaches or suggests such as connection, as described in detail above.

Claim 15 is an application of the invention to an L network. Again, as in claims 6, 9 and 13, claim 15, as amended, calls for first and second resonators being the only connections to a second electrode. None of the prior art teaches or suggests such as connection, as described in detail above.

Applicant regrets any confusion caused by the originally-filed drawings, but hopes that these remarks, along with the additional and corrected drawings, make clear the meaning of the claims.

The prior art made of record but not relied upon by the Examiner is no more pertinent to applicant's invention than the cited references for the reasons given above.

Applicant therefore respectfully submits that the claims in their present form should be allowable.

Respectfully submitted,

KLARQUIST, SPARKMAN, CAMPBELL,
LEIGH & WHINSTON

By 

Mark L. Becker

Registration No. 31,325

Klarquist, Sparkman, Campbell,
Leigh & Whinston
One World Trade Center, Suite 1600
121 S.W. Salmon Street
Portland, Oregon 97204
Telephone: (503) 226-7391